(3) Feb. 26, 1914. One grain ammonium iodide (capsule) given.

Iodine reaction in sputum was negative after 1, 2, 3, 5, 10, 15, 20, 25, 30 minutes.

Positive after 36 minutes.
Positive after 8 hours.
Positive after 17 hours.
Positive after 20 hours.
Positive after 22 hours.
Positive after 22½ hours.
Negative after 23 hours.

To eliminate possible source of error by gross contamination of discharges during administration the drug was given in capsule. Moreover the reaction was absent in the sputum until 36 minutes after the drug was taken. Also the iodine reaction was found to be negative in mucus obtained by swabbing the tonsils and buccal mucous membrane two hours after the iodine was administered, at which time the reaction was strongly positive in the sputum.

In the urine the reaction was negative at 1, 5, 10, 20, 30, 40, 50, 60 minutes after administering gr. i ammonium iodide in capsule.

Positive at 75 minuutes.
Positive at 2 hours.
Positive at 8 hours.
Positive at 17 hours.
Positive at 20 hours.
Positive at 22 hours.
Negative at 22½ hours.

That iodine is eliminated in the secretions in quantities sufficient to inhibit bacterial growth is demonstrated by the following experiment:

Streptococci and staphylococci were inoculated upon culture media:

(a) Equal parts bouillon and urine from individual 20 hours after receiving one grain ammonium iodide (at which time iodine reaction in urine was positive). No growth occurred after 24 and 48 hours.

(b) Equal parts bouillon and urine from same individual when iodine reaction not present in urine. Luxuriant growth after 24 hours.

An interesting point developed in the above reported experiments is the possibility of employing iodine internally as a urinary antiseptic.

In the treatment of the respiratory affections I have employed with equally beneficial results, hydriodic acid and the iodides of potassium, ammonium, sodium and strontium.

The syrup of hydriodic acid is especially applicable for adults with sensitive digestion and for children. Apart from this consideration the desideratum is to give sufficient iodide to definitely affect the respiratory secretion without causing unpleasant and unfavorable symptoms—coryza, lacrymation, and digestive disturbance.

(1.) Cal. State Jour. of Med., June, 1910.
(2.) Archives of Pediatrics, Vol. xxviii, No. 8, Aug., 1911.

HYGIENIC SHOEING—ANATOMICAL FACTS VS. CONVENTION AND STYLE.*

By C. C. CRANE, M. D., San Francisco.

(Continued from page 156, April issue.)

Such shoes are approved of, or at least permitted, by the parents during infancy and childhood, but during early adolescence they are promptly discarded as though the wearing of shoes which are comfortable and allow the feet to functionate were a sin, and in their place is substituted those shoes which will not permit of unhampered foot-function; those shoes which will not promote strength of the feet; those shoes which are, in fact, prone to institute foot-ills of various kinds and in varying degrees. And this substituting performance is nothing more or less than a conventional habit, neither lacking in precedent nor warranted by anatomical facts—a habit which is a costly tribute with a painful penalty, all in the name of style!

It may be worth our while to consider some of the more prominent faults of the ordinary shoe, and among these, as may be seen in the shoe submitted, is that one which crowds the toes together, abducting the big toe and its neighbor, adducting the little toe and its neighbor, the result of which is the elimination of the normal weightbearing line and the conversion of a stable foot-mechanism into an unstable foot-mechanism.

Another fault is that the shoe is often too short for the foot, and this, coupled with the common fault of upward curving of the distal portion of the sole, favors the continuation of, if not the production of, the so-called "contracted foot," which is so often seen and which is so difficult to cure.

Still another fault is the insufficient amount of leather which is used in the construction of the vamp, especially across the instep, and it is easy to understand how such a factor, combined with the usual position of the reinforced seam which extends across this portion of the shoe, will make almost certain the development of a flattened anterior arch, another condition most obstinate to cure.

In that portion of the shoe which corresponds to the longitudinal arch of the foot exists one of the most objectionable faults in the ordinarily constructed shoe. Little or no regard is paid to the fact that an arch is present on the inner side of the foot which is so constructed that it almost entirely disappears at the outer side of the foot.

To the careless disregard of the presence of, the character of and the function of, this arched portion of the foot may be attributed, in the author's opinion, a very large proportion of the foot-ills variously alluded to as "weak feet," "foot strain," "painful feet," "pronated feet," "fallen arches" and "flat feet."

And still another fault is that which fails to recognize the normal outward excursion of the cuboid bone which is incident to weightbearing, the importance of which has been emphasized by Dane, Osgood and others.

For practical purposes the cuboid bone of the

* Read before the San Francisco County Medical Society, November 18, 1913.

foot should be considered as a wedge-shaped bone with its blunted apex directed toward the inner side of the foot and with its base forming an important portion of the outer border of the foot. Obviously, if the shoe is so constructed that it interferes with the mechanism of this bone, the result must be translated in terms of valgus. The group of major faults in shoe construction includes those abusive structures which are unjustly denominated "heels."

The heels of shoes, more particularly of women's shoes, are usually too high and the treading surface too small, the ill-effects of which are manifested by the shortening of the muscles of the calf group; by the pronounced equinus position of the foot; by the disability of the dorsiflexors of the foot; by the marked insecurity about the ankle joint where security is of the utmost importance because, as walking is practised by shoe-wearing people, the heel of the shoe is the first part to come in contact with the surface walked upon. Although the immediate and local effects of such heels are quite apparent, there may be more latent and more remote effects which are none the less serious, for it is very probable that such heels also constitute a most important factor at least in the perpetuation of, if indeed not in the production of, those postural strains which are so often referred to the knees, to the sacroiliac joints and to the back.

A not insignificant fault about the heels of shoes, and this fault is more marked in men's than in women's shoes, is the row of nails which is made use of to keep the heels from being worn away on the outer side, thus baffling the foot in its attempt to maintain a strong position of supination and forcing it into that undesirable and harmful position of pronation.

Finally there is to be mentioned a fault which is present in nearly all shoes. This is the fault of pronation. Surely a foot may not be blamed for yielding to such a pernicious influence when this influence is present when the foot is at rest and is exaggerated when the foot is used for weightbearing.

The faults alluded to do not comprise all, but merely the more conspicuous and the more vicious ones. Although they are rather glaring even in the shoes submitted, yet they are much more evident in the usual shaped shoes as the types submitted are advertised as "orthopedic" with how little regard for veracity is left with you to decide.

It has already been insisted upon that a hygienic shoe should be patterned to fit a normal foot, but before taking up the detailed plan of construction of such a shoe it may be well to review some of the more important characteristics of the normal foot which are apparent in this model of an adult foot of an Indian who had never worn shoes.

You may notice that the inner border of the foot is slightly concaved; that there are distinct inter-digital spaces, the one between the big toe and its neighbor being large enough to accommodate an extra toe; that the big toe is slightly adducted so that when the inner borders of the feet are in contact, if straight lines are projected forward through the longitudinal axes of the big toes, such lines soon intersect; that the inner side of the instep is thicker than the outer side; that there are two arches present, the anterior or transverse, and the posterior or longitudinal, and that these arches are distinct and yet they blend with each other; that the longitudinal arch diminishes in height very perceptibly as the outer border of the foot is approached; that the cuboid bone becomes more prominent when the foot is used for weightbearing than it is when the foot is at rest; that the plantar surface of the heel is convexed both from before backward and from side to side; that the heel is not much more than half as wide as the widest part of the toe end of the foot; that the insertion of the tendo Achilles is not in the middle of the heel but distinctly to the outer side; that when the foot is used for weightbearing, with the toes directed forward, it is in a definite position of supination which is the position of maximum strength.

The companion model which is submitted represents the same foot when carrying weight and shows the excursion which the arches enjoy and you will probably agree that this weightbearing model appears to have even a greater amount of potential power than its companion model does at rest.

Although it is hardly within the intent of the paper yet it may be interesting to contrast some of these other models with the ones already studied, their corns, callosities, bunions, distortions, deformities and general alterations serving to bear mute testimony to the punishment to which they have been subjected by faulty shoeing.

These normal characteristics are the chief ones to be considered in the construction of hygienic shoes and they serve to indicate that such a shoe should be straight or slightly concaved on the inner side; that it should be fully as long as the foot is when the foot bears its normal top-weight; that it should be roomy enough at the toe end to avoid obliteration of the inter-digital spaces; that the sole should be flexible; that it should be flat at the distal end to avoid hyperextension of the toes; that it should be slightly convexed in that portion which is covered by the transverse arch of the foot; that it should be molded in that portion which is covered by the longitudinal arch in accordance with the anatomical findings, that is: much higher on the inner side than on the outer side, and in such a manner and to such a degree that it does not interfere with or touch the longitudinal arch but will, at the same time, act as a support to this arch when it sags, as it does, physiologically, from fatigue; that the heel end of the sole should be slightly concaved from side to side and from before backward; that the heel of the shoe should be broad, low and slightly higher on the inner side than on the outer side, the latter to counteract the pronating effect of the calf group of muscles; that the inner side of the shoe, at the instep, should be fuller than the outer side, at the instep, to correspond to the greater thickness of the former and that some fullness should be present on the outer side of the shoe to permit of the valuable excursion of the cuboid bone in weightbearing.

The shoe should be made of the blucher type

which permits of better fitting to the constantly changing size of the foot as it occurs, dependent upon the various changes of temperature, activity and rest and, too, because such a shoe permits of more freedom over the instep portion.

The question as to the advisability of wearing a high or a low shoe is not entirely insignificant. High shoes are often worn and insisted upon because of the presumption, probably a faulty presumption, that high shoes support weak ankles; but whence came the weak ankles? Did nature not do her work well, or have high shoes, with their bandaging and constricting effects, crippled these parts to such an extent that relief is sought from just the source which produced the disability? A good rule would be to wear low shoes; high shoes may be worn when the inclement weather makes their use temporarily advisable.

In order that the best results may be obtained from hygienic shoeing it is imperative that suitable stockings be used or some of the desirable effects will be counteracted if not defeated. The ideal stocking is the digitated stocking. To enhance the value of hygienic shoes the wearer should toe forward when standing and walking.

All this in the name of that complex problem of balance and human efficiency.

Discussion.

Dr. J. T. Watkins: Someone, I think it was Mathew Arnold, has defined criticism as "The effort to detect and to direct attention to whatever was best and most beautiful in the world." Accepting this definition, it is now my function and pleasant privilege to direct your attention to and to emphasize the excellent qualities of Dr. Crane's paper.

Especially am I able to do so since Dr. Crane was kind enough the other day to read his paper to me. Recognizing very clearly as I then did with what care I must prepare this discussion, if I would have you believe it to be an extemporary effort, I began to take copious notes on my cuff. And there I noticed the first point which I want to make here.

Almost at once I found that, instead of making a critical appraisement of what he had to say I was revelling in the melody of Dr. Crane's euphoneous diction. I was disregarding what he said while admiring how he said it. Lest you may have been similarly affected I propose first of all to summarize Dr. Crane's paper, and then to enlarge upon portions of it.

That deformations of the feet are usually due to bad shoes; that distortions of the feet may cause no subjective symptoms; that subjective symptoms in such feet may often be relieved by proper shoes; that deformations which cannot be relieved by proper shoeing might have been prevented by proper shoeing; orthopedically speaking all of these things may be said to be axiomatic.

That manufacturers turn out bad shoes because those are the shoes the public wishes to buy does not call for argument; and that the medical profession has been remiss in not warning the public of the ill effects consequent upon the wearing of bad shoes is as certain as it is easy to explain. The profession didn't know all the facts itself, and didn't heed those it did know or suspect.

Now the first thing I want to say is that there can be such a thing as too good a shoe theoretically for a given foot. I recall that the first money I spent after I was married went to buy my wife what I considered to be a proper pair of shoes. And as she since said in the dialect of her province, "That orthopedic shoe gave me the first cawn I ever had in all my bawn days."

In fitting a defective thin foot we must seek to find a shoe which need not necessarily have the most ideal shape; that feature can be overdone. The shoe must be that in which the particular foot in question finds the most comfort.

While I listened to Dr. Crane's strictures on the profession I looked at his foot and then at my own. In each instance my eyes were soothed by encountering the well-known orthopedic shape, suggesting perhaps more than any other one thing a ham encased in leather. But when I turned to see how Mrs. Crane and Mrs. Watkins were shod there was no denying that their shoes broke every canon of the orthopedic faith and conformed as consistently to the conventional idea of perfection. Still much as I admired Dr. Crane's feet I do not think I looked longest at them. I am pretty sure that I didn't.

However, the point I would make is this: If we, Dr. Crane and I, of the strictest sect of the Pharisees, cannot get better results than this even at home, how can we consistently expect good results from you poor "Publicans and Sinners"?

For several years I have examined the feet of all candidates for positions in the police and fire departments. In all I might have examined considerably over 3000 pairs of feet. The remuneration is about one cent a pair and is, I think you will admit, not excessive. However the opportunity to examine the feet of great numbers of supposedly normal young men was not to be overlooked. In confirmation of one of Dr. Crane's contentions I may tell you that I almost never saw a foot which did not present more or less extensive shoe distortions. Again among the first 780 persons examined I absolutely rejected 33% for defective feet.

Now about normal feet. It seems to me there can be no fixed standard of perfection, no normal deviations from which must be regarded as abnormal. From my own observations and from what I have been able to learn by studying the photographs of wild people which friends who had traveled in the Orient and elsewhere have brought me, I have seemed to be able to differentiate three primary types of foot; the relatively narrow high arched foot of the Caucasian, the expanded snow shoe (really sand shoe) type of foot of the desert dwellers, that is, of the Semitic peoples, and the Negroid or prehensile manipulate foot. This last I have seen only in pictures. It may be that the first two types are age long functional adaptations of the third; evolved from it under different environments.

It has been my experience that modern city life produces foot troubles most often among persons of Semitic extraction. This judging from their conformation is what one would naturally expect. Again among feet of the same type there are conceivable variations of height or depression of the arch, variations of pitch, of elasticity, of flexibility, and so on, which are still within the bounds of what might properly be classed as normal.

Returning now to the foot which causes painful symptoms, that is the subjectively abnormal foot, we note almost at once that there is no necessary relation between the height or depression of the arch, or for that matter of any other objective distortion, and the subjective symptoms which a foot may present. I think reports of two of my cases will illustrate the importance of this observation.

A young man was referred to me by his father whom I had relieved of some foot disturbances. The son was having trouble with plates which had been prescribed for him by an orthopedic surgeon of eminence. His feet were very, very flat, nevertheless he said he had never felt any discomfort

whatsoever nor been in any way aware of this defect till he had attended one of the universities. Here the physical director had uncovered his pedal imperfections and he was referred forthwith to the orthopedic luminary. Plates were then applied with the unfortunate result described. I threw away his plates and had appropriate shoes made for him and "he lived happily ever afterward."

Case II might be called the reverse of case I. A rather young lady came to me wearing exceedingly high metal plates of what is known as the square type. By a singular coincidence they happened to have been prescribed by the same surgeon. Instead of being low her arches were remarkably high. The plates had been raised from time to time during the four years she had been wearing them until, when she came to me, the patient had sustained severe pressure atrophy of practically all of the intrinsic muscles of the foot which was now balanced insecurely upon the apex of the plate's curve. Here was a foot beautiful to look upon but functionally all but useless. Proper shoes, massage, and appropriate exercises gradually effected a cure in this case.

Dr. Crane quoted Drs. Dane, Osgood and others as to the importance of the shape of the cuboid and of its relation to the other bones of the foot. I do not question its importance, though I doubt that we are wise in singling out any one element in the complicated mechanics of the foot for special attention.

It is barely possible that some of you may recall a paper I read once on "weak foot" and in which I quoted Bradford and Hake at some length. These gentlemen directed attention to a procession of osseous tubercles upon the under surfaces of the bones comprising the anterior pillar of the inner longitudinal arch. They showed with apparent mathematical and anatomic exactness that by flexing the great toe, a backward thrust might be exerted by the first metatarsal bone upon the first cuneiform and if the latter were held rotated outward by the pull of the tibialis anticus, this anterior metatarsal thrust would be transmitted through the internal cuneiform to the scaphoid. As a consequence the scaphoid would be crowded against the head of the astragalus and thus prevent this bone from rotating inward and downward and descending from its seat on the back, that is the upper surface, of the os calcis. I showed a plate by which all of these thrusts could in theory be accomplished. But later on I discovered that Dr. Whitman, also a prominent authority on weak foot, paid no special attention either to the cuboid, to the cuneiform or to any of their relations. This writer besides a proper shoe devised a special plate and stopped only to show that it protected, at either side of the foot, the transverse tarsal joint. Now all of these luminous ones cured most of their patients, consequently all of them must have been essentially right. If therefore points of contact in their various treatments could be discovered one would be justified in ascribing to such contact the first place in the care of defective feet. A comparison of the methods will show two such points of agreement; 1, appropriate shoeing or muscle building.

I really believe that the explanation of the conditions I have already referred to may be found in the presence or lack of an adequate musculature. A distorted foot will be symptomless if the musculature be strong enough to compensate for the mechanical defect and a perfectly shaped foot will be painful if there be a muscular insufficiency. Finally I believe that this is frequently referable to some constitutional depression or remote infection. Your patient may need a tonic or his tonsils seen to more than an arch supporter.

Because it supports this contention permit me in closing to report briefly the following failure: A lady weighing 193 lbs. who had not found relief elsewhere was brought to me by a patient. I began with massage, the Shaffer stretching machine, resistance exercises and as nearly correct a shoe as her foot would tolerate. Within three weeks she was able to go all over the golf links without discomfort. Thinking that if she could only get rid of 40 or 50 lbs. the foot would be permanent, I sent her to an eminent "internist" with the request that he reduce her. His reply was that she had a pretty big thyroid and the outlook was not encouraging; however, he would do his best. She began to lose weight rapidly, but the treatment so upset her nutritive processes that the poor lady went all to pieces and the first part of her to break down was the hard-earned muscular compensation in her feet. Given such a case again I should try to build her foot muscles up to take care of her weight. I should not try to pull the latter down to meet the limitations of her foot muscles.

Dr. Leonard Ely: Dr. Crane's remarks about the total depravity of shoemakers I agree with absolutely. The patients I have succeeded in inducing to adopt some rational form of foot wear may, if they have the means to have their shoes made to order, improve; they will tolerate the ugly shoe until the pain leaves them and no longer. It has been a source of despair to me. I have found a few fairly rational models of shoes which I recommend to people, but in every new place I move to I have to go to the shoemaker and tell him that he is to make shoes for my patients! If I go and talk to him, and whittle out a last until it pleases me, he will sometimes make the shoe as I ordered it. Every shoemaker knows more than any doctor! It is only the prospect of an immediate fee which will induce him to carry out instructions; and one cannot blame him. He is no philanthropist. He is in business to sell shoes, and if people refuse to buy well-shaped shoes, he will not keep them in stock. The standards of beauty are past finding out. To my mind a shoe that is built to the proper foot is a thing of beauty; one that is not, is ugly; but people will wear pointed shoes and high heels unless their feet cause them great suffering.

Dr. J. Rosenstirn: I would never have spoken to this somewhat accentuated specialistic subject if Dr. Rixford had not declared that no good comes from supporting the arch. He based his opinion on personal experience and the same experience prompts me to differ with him. I have suffered intensely from a breaking down of my anterior or transverse arch, and the moment I put a support in my shoe I was relieved. So you see that doctors even disagree in the result of remedies of their own ills, but I wanted to give my own experience in confirmation of those views that sensible support of the arch will do good, provided always the diagnosis is correct. In my own case I gained complete relief after the use of the appliance and, as Dr. Watkins stated of his patients, have lived happily ever since, with gratifying anticipation of a very much prolonged further happy existence.

SOCIETY REPORT

PROCEEDINGS OF THE SAN FRANCISCO COUNTY MEDICAL SOCIETY.

During the month of March, 1914, the following meetings were held:

Medical Section, Tuesday, March 3.

1. Tests of Liver Function. Thomas Addis.
2. The Cirrhoses of the Liver. J. V. Cooke.